T0220T* 6ET290T

TRANSFER SWITCH SCHEMATIC

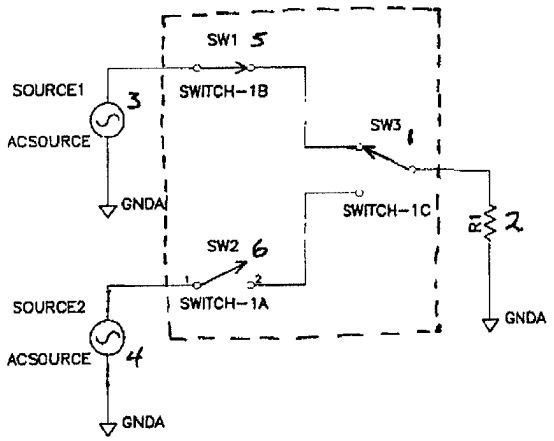



Fig. 1

RELAY TIMING

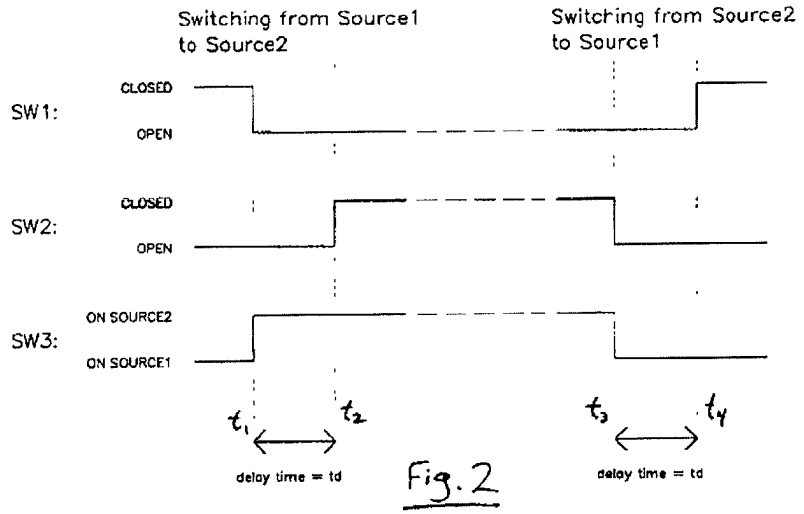



Fig. 2

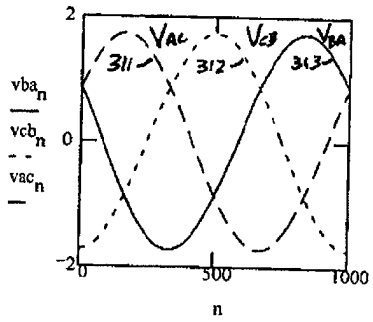



Fig. 3a

(3—phase rectified delta)

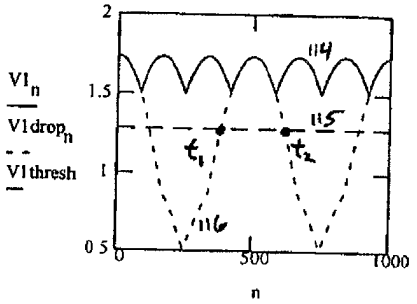



Fig. 3b

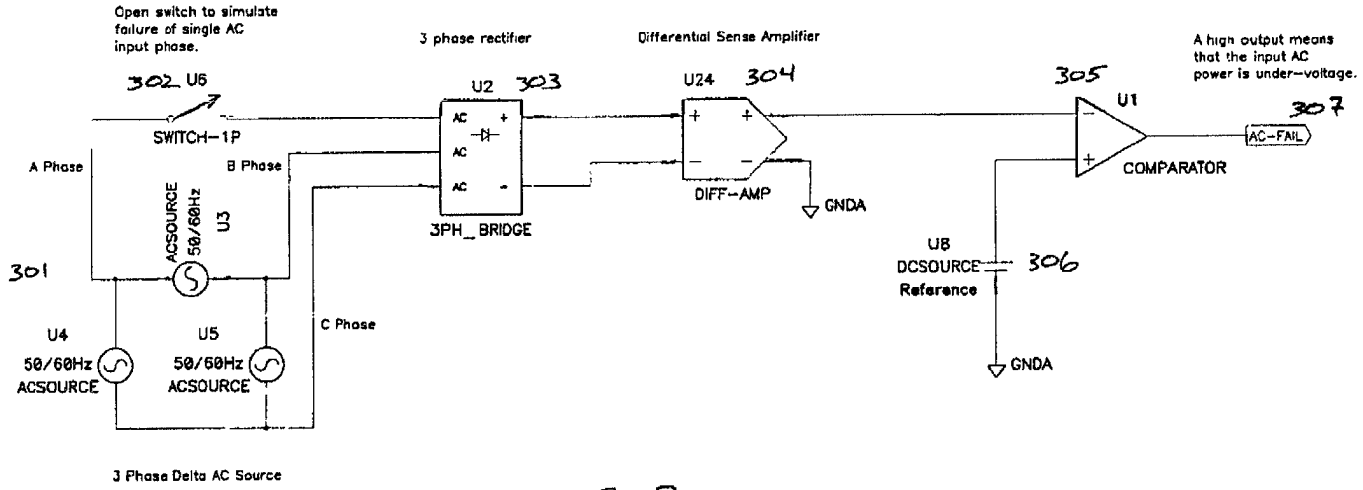



Fig. 3

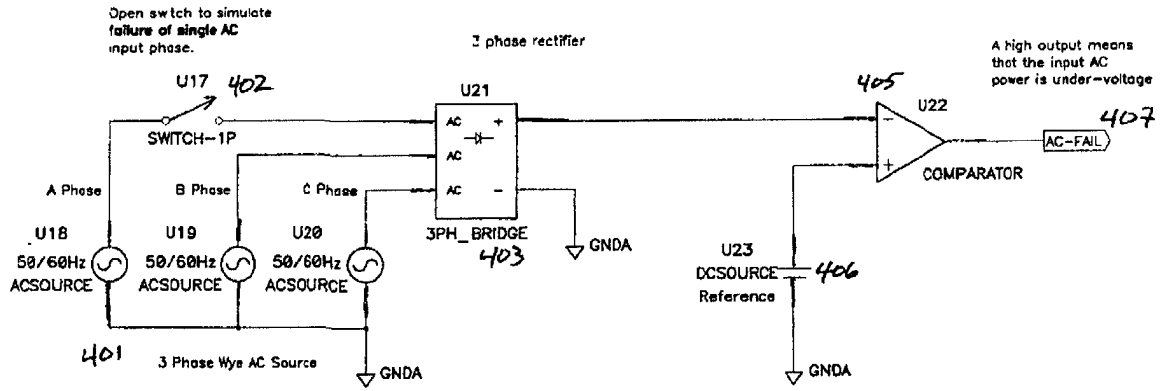

Open switch to simulate failure of single AC input phase.
3 phase rectifier
A high output means that the input AC power is under-voltage
U17
402
SWITCH-1P
U21
AC
AC
AC
3PH_BRIDGE
403
GNDA
405
U22
407
AC-FAIL
COMPARATOR
A Phase
B Phase
C Phase
U18
50/60Hz
ACSOURCE
U19
50/60Hz
ACSOURCE
U20
50/60Hz
ACSOURCE
U23
DCSOURCE
Reference
406
401
3 Phase Wye AC Source
GNDA
GNDA

Fig. 4

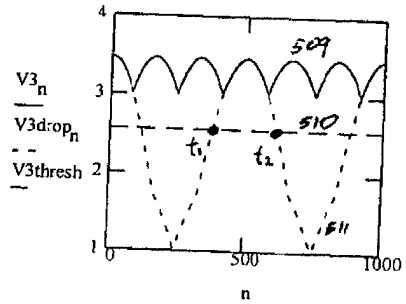

4
3
2
1
0
500
1000
n
V3n
V3drop n
V3thresh
509
510
511
t1
t2

Fig. 5b

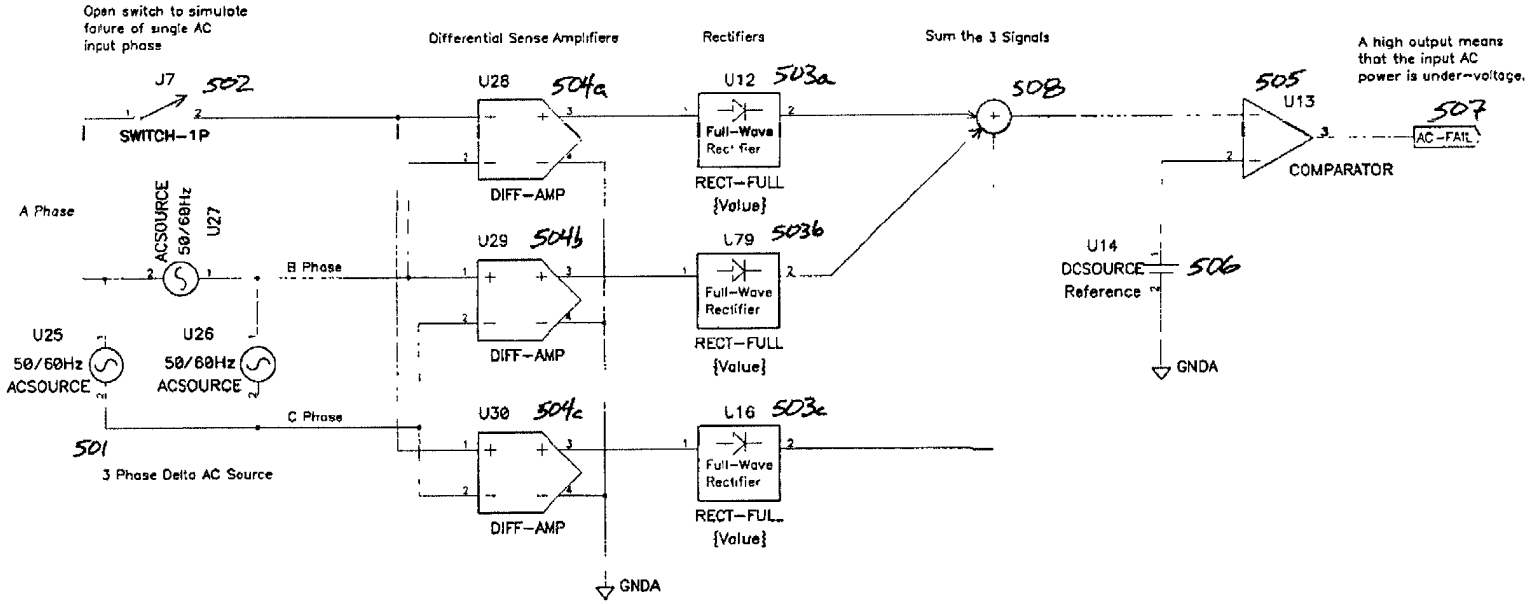

Open switch to simulate failure of single AC input phase
Differential Sense Amplifiers
Rectifiers
Sum the 3 Signals
A high output means that the input AC power is under-voltage.
J7
502
SWITCH-1P
U28
504a
DIFF-AMP
U12
503a
Full-Wave Rectifier
RECT-FULL
{Value}
508
505
U13
COMPARATOR
507
AC-FAIL
A Phase
ACSOURCE
50/60Hz
U27
B Phase
U29
504b
DIFF-AMP
U79
503b
Full-Wave Rectifier
RECT-FULL
{Value}
U14
DCSOURCE
Reference
506
GNDA
U25
50/60Hz
ACSOURCE
U26
50/60Hz
ACSOURCE
C Phase
U30
504c
DIFF-AMP
U16
503c
Full-Wave Rectifier
RECT-FULL
{Value}
501
3 Phase Delta AC Source
GNDA

Fig. 5a

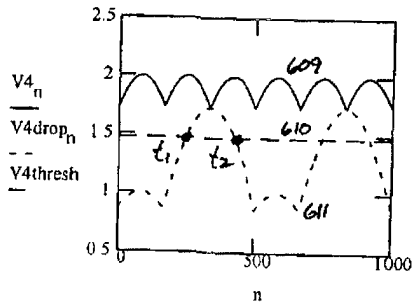

2.5
2
1.5
1
0.5
0
500
1000
n
V4n
V4dropn
V4thresh
609
610
611
t1
t2

Fig. 6b

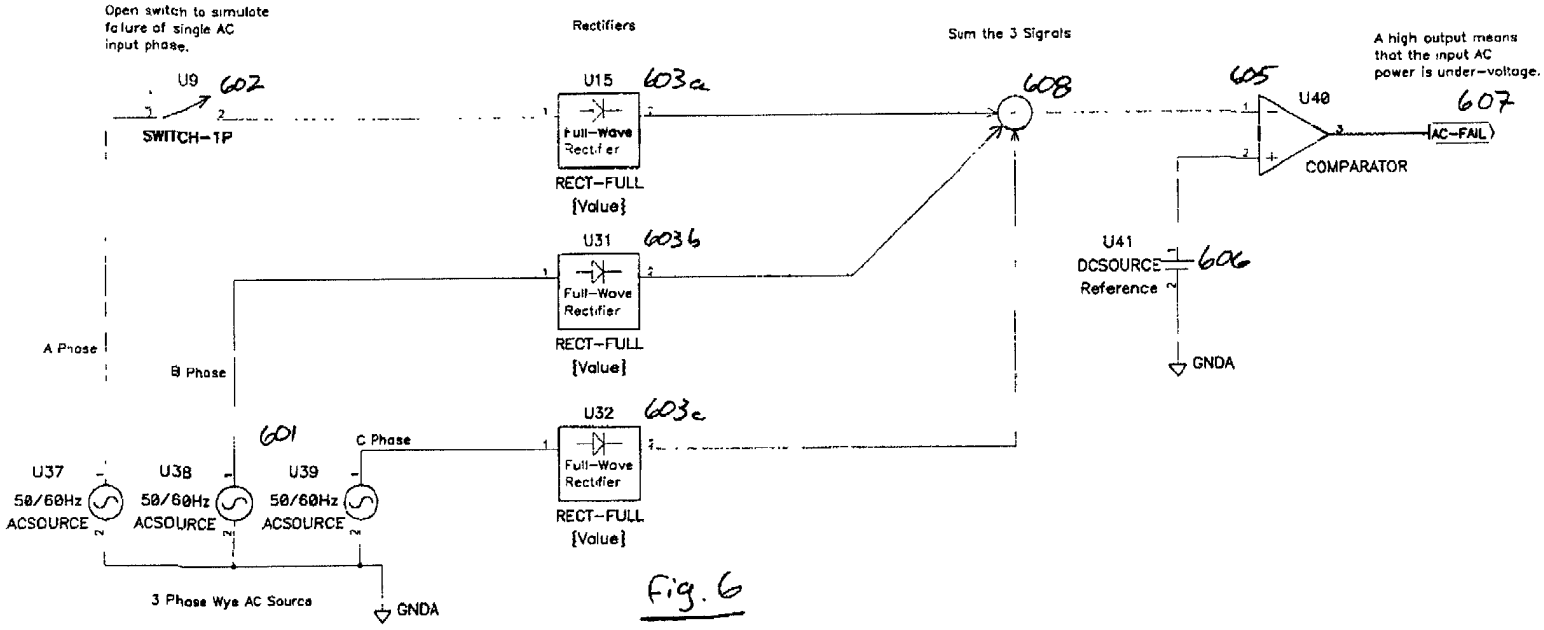

Open switch to simulate failure of single AC input phase.
U9
602
SWITCH-TP
Rectifiers
U15
603a
Full-Wave Rectifier
RECT-FULL
{Value}
U31
603b
Full-Wave Rectifier
RECT-FULL
{Value}
U32
603c
Full-Wave Rectifier
RECT-FULL
{Value}
Sum the 3 Signals
608
605
U40
COMPARATOR
A high output means that the input AC power is under-voltage.
607
AC-FAIL
U41
DCSOURCE
Reference
606
GNDA
A Phase
B Phase
C Phase
601
U37
50/60Hz
ACSOURCE
U38
50/60Hz
ACSOURCE
U39
50/60Hz
ACSOURCE
3 Phase Wye AC Source
GNDA

Fig. 6

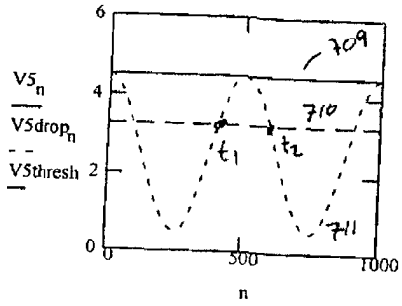

6
4
2
0
0
500
1000
n
V5n
V5dropn
V5thresh
709
710
711
t1
t2

Fig. 7b

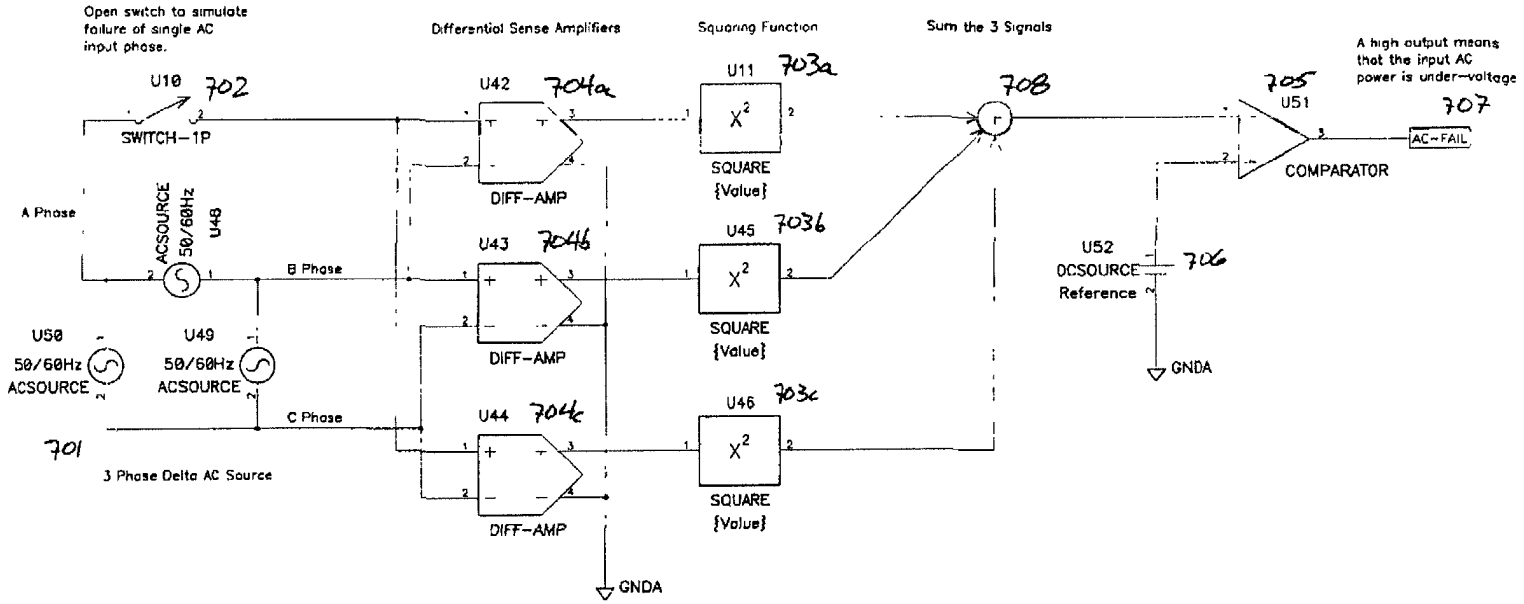

Open switch to simulate failure of single AC input phase.
Differential Sense Amplifiers
Squaring Function
Sum the 3 Signals
A high output means that the input AC power is under-voltage
U10
702
SWITCH-1P
A Phase
ACSOURCE
50/60Hz
U48
B Phase
U50
50/60Hz
ACSOURCE
U49
50/60Hz
ACSOURCE
C Phase
701
3 Phase Delta AC Source
U42
704a
DIFF-AMP
U43
704b
DIFF-AMP
U44
704c
DIFF-AMP
GNDA
U11
703a
X2
SQUARE
{Value}
U45
703b
X2
SQUARE
{Value}
U46
703c
X2
SQUARE
{Value}
708
705
U51
COMPARATOR
AC-FAIL
707
U52
DCSOURCE
Reference
706
GNDA

Fig. 7a

T0820T 6ET2900T

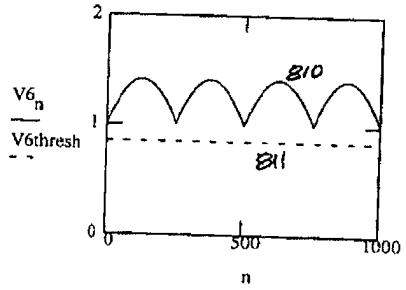



Fig. 8b

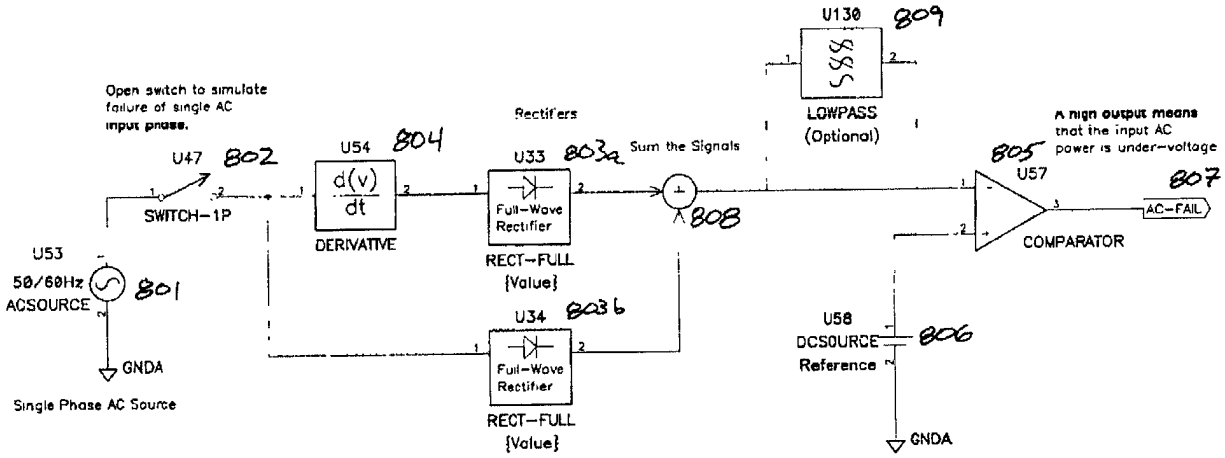



Fig. 8a

T02207 6E7900T

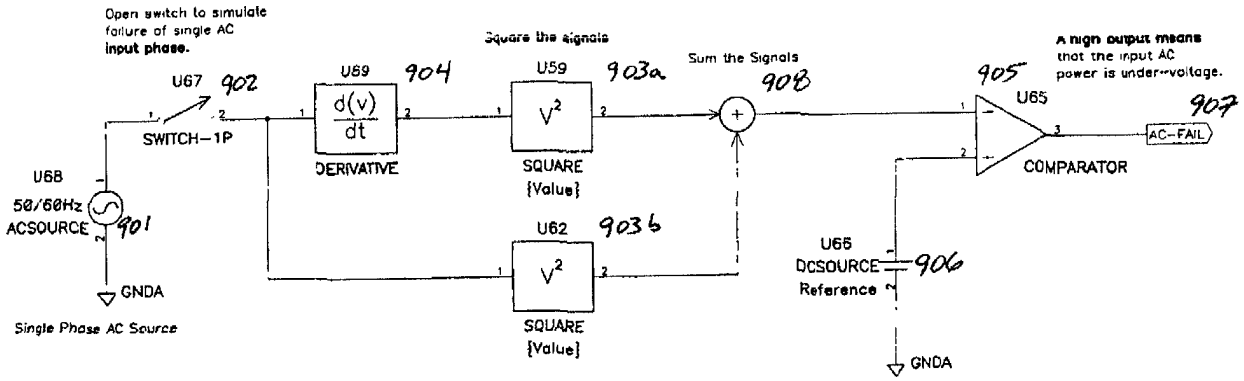



Fig. 9a

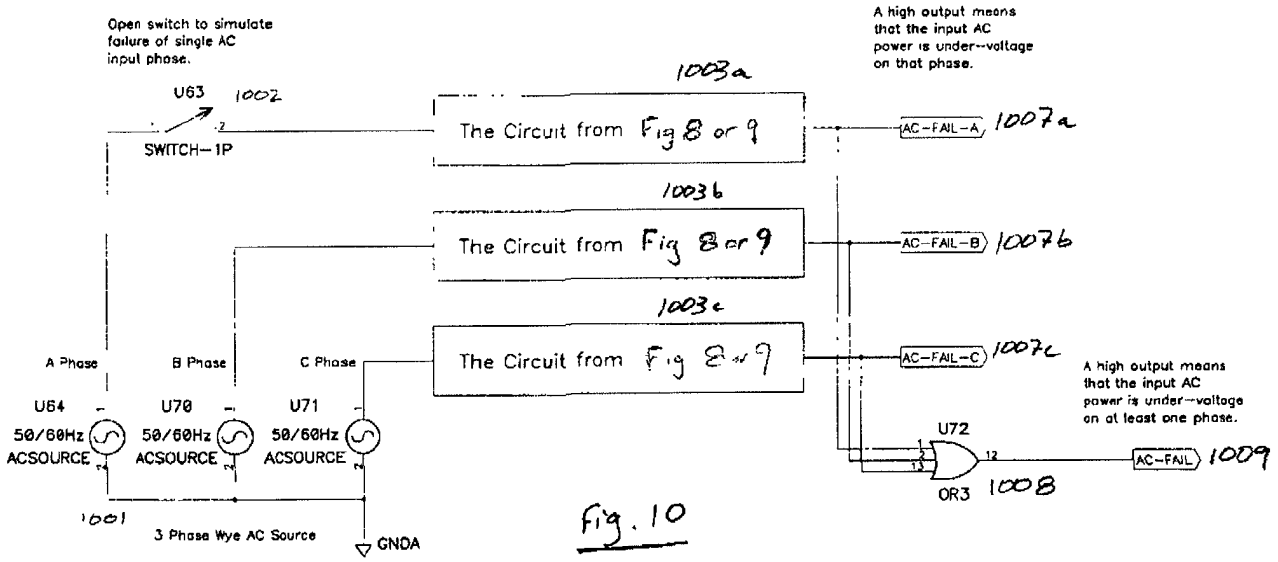

Open switch to simulate failure of single AC input phase.
U63
1002
SWITCH-1P
1003a
The Circuit from Fig 8 or 9
A high output means that the input AC power is under-voltage on that phase.
AC-FAIL-A
1007a
1003b
The Circuit from Fig 8 or 9
AC-FAIL-B
1007b
1003c
The Circuit from Fig 8 or 9
AC-FAIL-C
1007c
A Phase
B Phase
C Phase
U64
U70
U71
50/60Hz ACSOURCE
50/60Hz ACSOURCE
50/60Hz ACSOURCE
1001
3 Phase Wye AC Source
GNDA
U72
OR3
1008
AC-FAIL
1009
A high output means that the input AC power is under-voltage on at least one phase.

Fig. 10

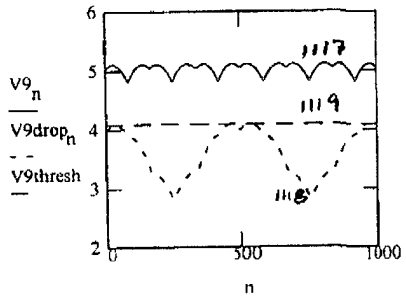



Fig. 11c

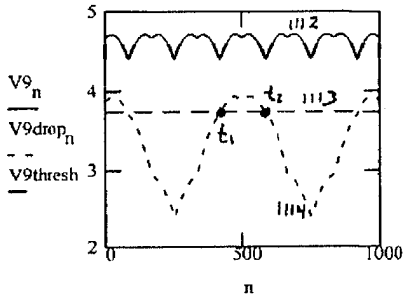



Fig 11b

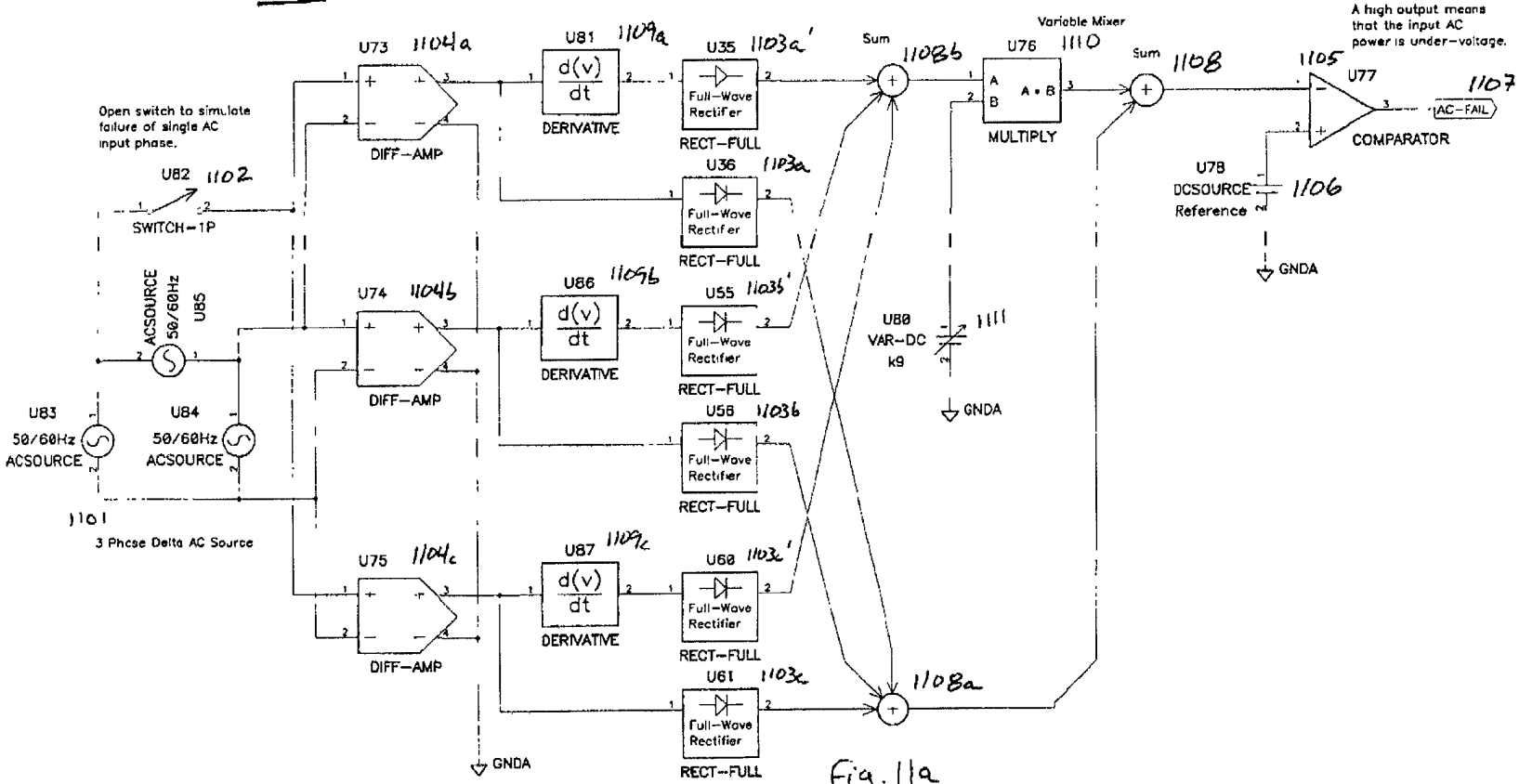



Fig. 11a

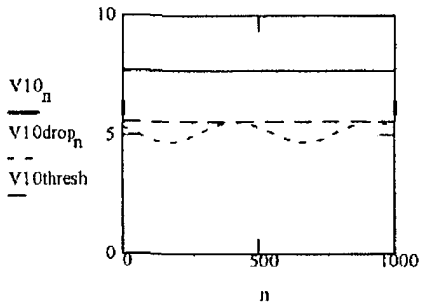



Fig. 12c

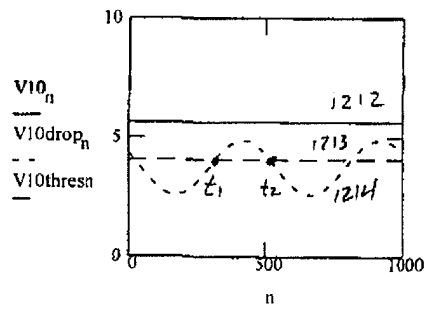



Fig. 12b

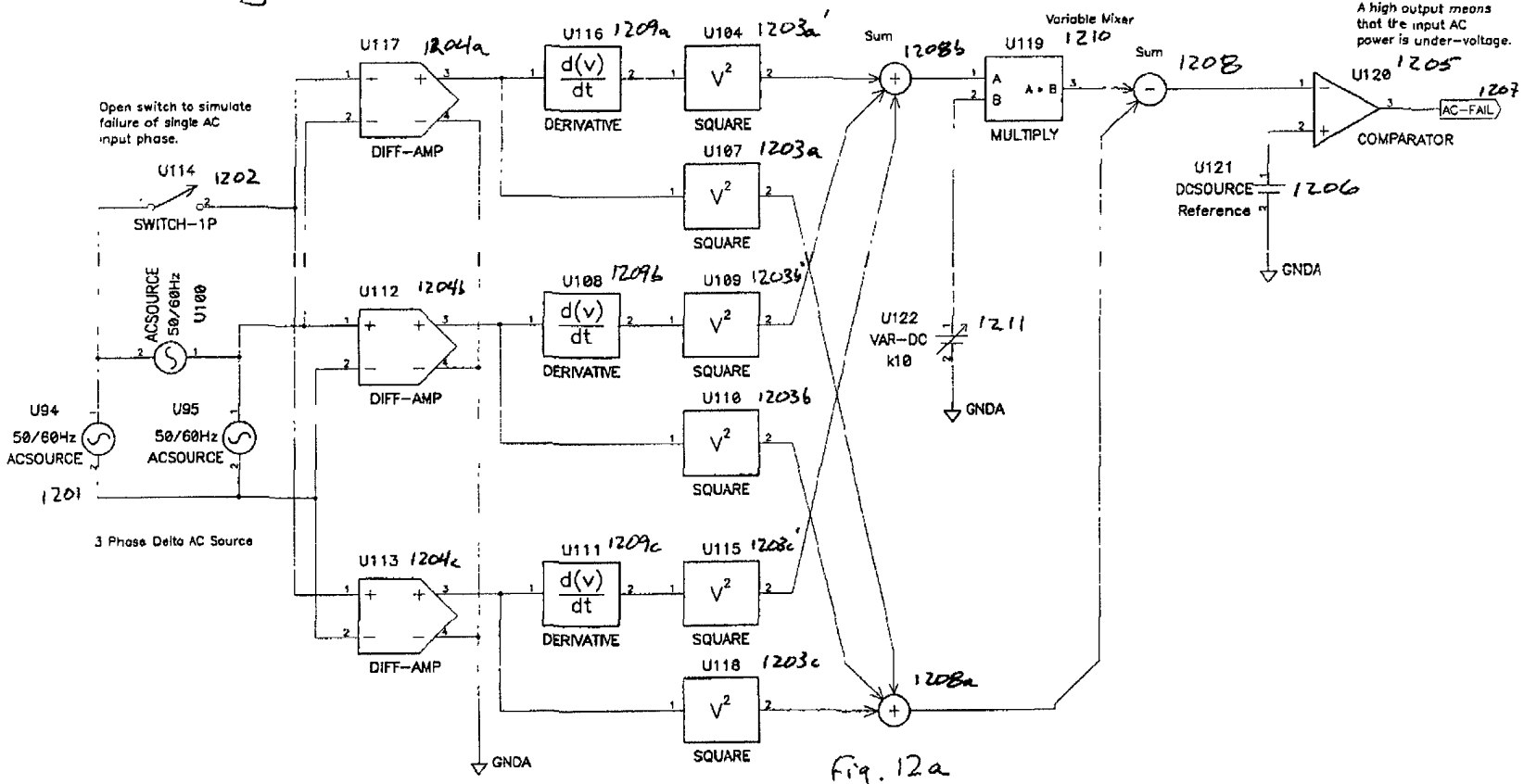



Fig. 12a

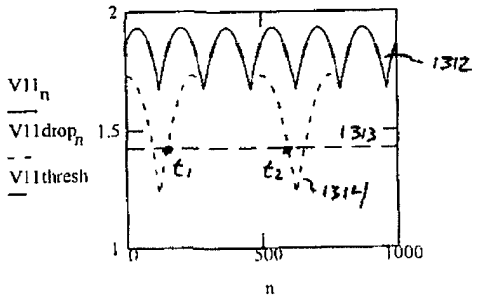



Fig 13b

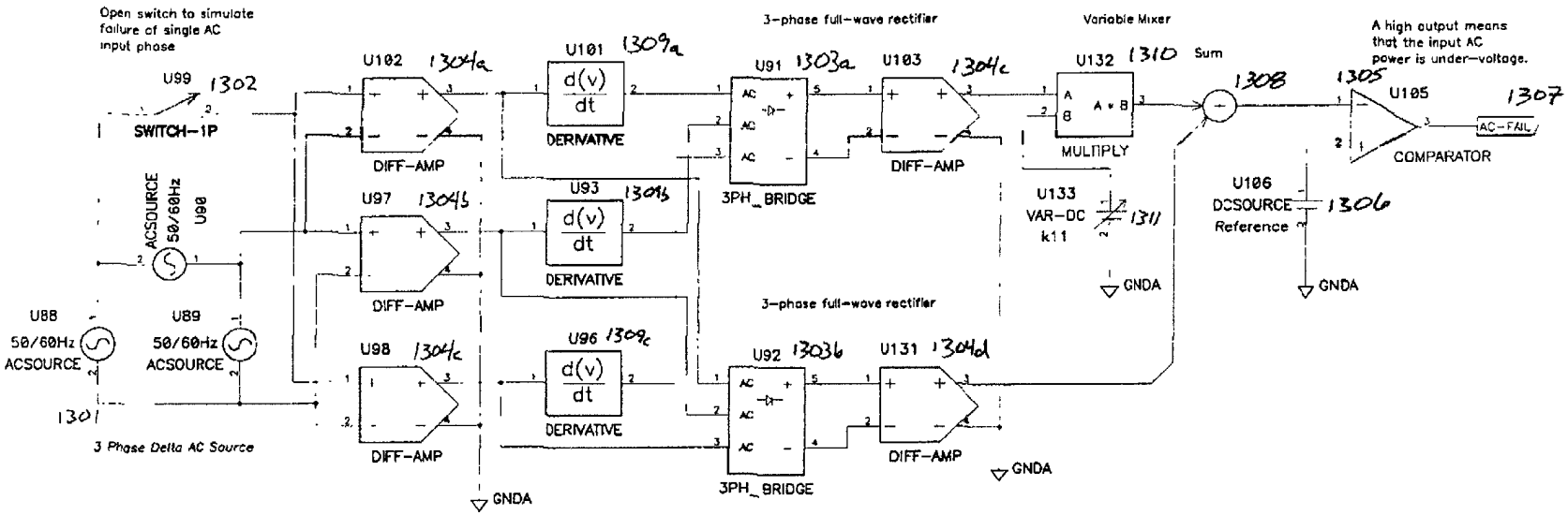



Fig. 13a

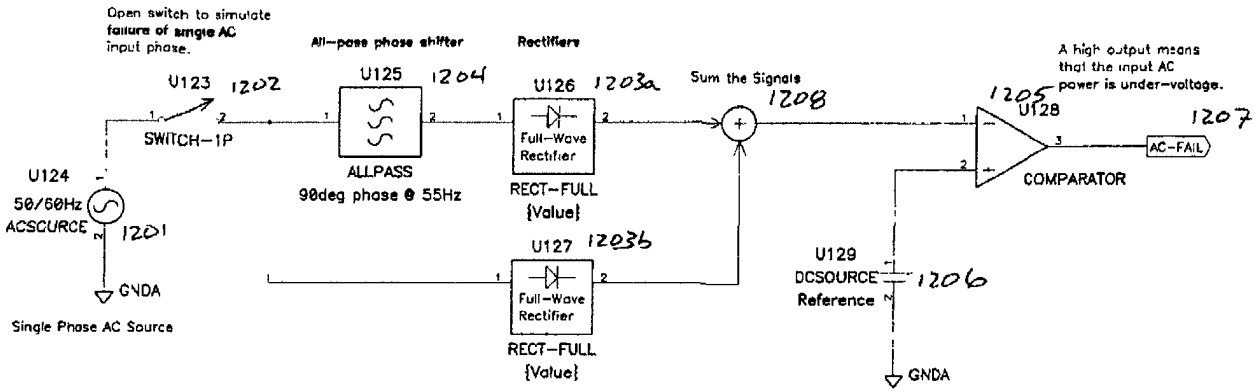

Open switch to simulate failure of single AC input phase.
All-pass phase shifter
Rectifiers
A high output means that the input AC power is under-voltage.
U123
1202
SWITCH-1P
U125
1204
ALLPASS
90deg phase @ 55Hz
U126
1203a
Full-Wave Rectifier
RECT-FULL
{Value}
Sum the Signals
1208
1205
U128
COMPARATOR
1207
AC-FAIL
U124
50/60Hz
ACSOURCE
1201
GNDA
Single Phase AC Source
U127
1203b
Full-Wave Rectifier
RECT-FULL
{Value}
U129
DCSOURCE
Reference
1206
GNDA

Fig. 14